
Source: China Telecom, Huawei
Title: New Study Item proposal: Flexible eNB-ID and Cell-ID in E-UTRAN
Document for: Approval
Agenda Item: 10.1.3

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

Title: **SI: Study on Flexible eNB-ID and Cell-ID in E-UTRAN**

Acronym: FS_LTE_FNBID

Unique identifier:

1 3GPP Work Area

X	Radio Access
X	Core Network
	Services

2 Classification of WI and linked work items

2.0 Primary classification

This work item is a ...

X	Study Item (go to 2.1)
	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.
If you are in doubt, please contact MCC.

2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

2.4 Work task

Parent Building Block		
Unique ID	Title	TS

3 Justification

In the data booming age, the LTE network is widely deployed today with more and more eNBs (including Macro/Pico eNBs especially small cells in hotspots) and LTE frequencies. However, there are only two types of eNB IDs supported in current specification:

- Macro eNB: 20 bits eNB-ID(about 1.04 million), 8 bit Cell-ID(up to 256 cells) in one eNB

- Home eNB: 28 bits eNB-ID, only one cell in an eNB

With the deep LTE deployment, there will be various scenarios for different requirements for eNB. ~~On one hand, the large number of small cells with limited cells inside requires high capacity of eNBs; on the other hand, the eNB may accommodate more cells with the increasing processing capability. To meet the variable requirements in different scenarios, the extension the eNB-ID or Cell-ID should be considered.~~

- ~~On one hand, there will be more and more small eNBs with limited number of cells.~~ Being a big country with a vast and complex terrain, China has experienced profound changes to its urban and rural infrastructure. To improve the quality of LTE network effectively, there is already very large number eNBs deployed in big countries E.g. well over 0.46 million LTE/LTE-A eNBs have been deployed in China Telecom's network by the end of 2015. Moreover, considering the demand of mobile data traffic is increasing dramatically every year, more and more eNBs will be deployed to improve network capacity and user experience especially the small ~~cell~~eNB deployments in hotspot areas. The maximum number of eNBs in a PLMN is predicted to exceed 1 million in the coming years. Therefore how to effective ~~solve the shortage of~~deploy more than 1 million eNB-ID's is a big challenge for operators.
- ~~As an architectural evolution of the distributed base station system, centralized deployment e.g. which is named "cloud base station" can take~~On the other hand, the eNB may accommodate more cells with the increasing processing capability.

Take advantage of many technological advances in wireless, optical and IT communications systems. With the increased BBU hardware processing capability, improved transport and more CC supported in CA (e.g. beyond 5CC aggregation), one ~~"cloud base station" in centralized deployment has~~eNB may have the capability to serve more than 256 cells, ~~e.g. in C-RAN, one eNB may serve 576 cells or more.~~ One potential benefit with a large eNB handling more cells may be a reduction of this type of "cloud base station" is effectively reducing S1 signalling towards core network, ~~effectively reducing~~ implementation complexity and OPEX.

4 Objective

4.1 Objective of SI or Core part WI or Testing part WI

The objective of this study is to identify potential technologies ~~for extension to~~ deploy a large number of eNB-ID's and also eNB's that can handle more Cell-ID's in E-UTRAN. The detailed objective is as follows:

1. investigate and evaluate the potential solutions ~~for Flexible eNB-ID and Cell-ID to:~~

2. Support of eCGI in E-UTRAN:

- ~~Extending eNB-ID for Large~~the number eNBs serving with less of eNB beyond 1.04 million in a PLMN
- Support of the number of cells beyond 256 in an eNB
- ~~Extending Cell-ID for "cloud base station" serving more than 256 cells.~~

3. ~~The evaluation should take into account the following:~~

- No impact on UE operation and air interfaces;
- Minimize the impacts on CN;

- Co-existence and interworking with current Macro and HeNBs

4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise: For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #70 #71						Q1/2016				RAN	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
84	84	93	93	89	91	78	78	78	78		

RAN #71 #72												Q2/2016				RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	89bis	91bis	78bis	78bis	78bis	78bis	85	85	94	94	90	92	79	79	79	79
					1										1				

RAN #72 #73						Q3/2016				RAN	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
86	86	95	95	91	93	80	80	80	80		
					1						

RAN #73 #74												Q4/2016				RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
86bis	86bis	95bis	95bis	91bis	93bis	80bis	80bis	80bis	80bis	87	87	96	96	92	94	81	81	81	81

RAN #74 #75						Q1/2017				RAN	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
88	88	97	97	89	95	82	82	82	82		

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

additional comments to the time budget proposal:

- 5 Service Aspects
- 6 MMI-Aspects
- 7 Charging Aspects
- 8 Security Aspects
- 9 Impacts

Affects:	UICC apps	M E	A N	C N	Other s
Yes			X	X	
No	X	X			X
Don't know					

10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR36.xyz	Study on Flexible eNB-ID and Cell-ID in E-UTRAN	RAN3		RAN#72	RAN#73	

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments

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12 Work item leadership

RAN WG3

13 Supporting Individual Members

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